Material Safety Data Sheet

Halocarbon R-114 (1,2-Dichlorotetrafluoroethane)

Section 1. Chemical product and company identification

Product name : Halocarbon R-114 (1,2-Dichlorotetrafluoroethane)

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Product use : Synthetic/Analytical chemistry.

Synonym : FC-114; Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-; 1,2-Dichlorotetrafluoroethane; Ethane, 1,2-dichlorotetrafluoro-; Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro- (Refrigerant gas R114); Dichlorotetrafluoroethane; Dichlorotetrafluoro-ethane; Refrigerant 114; Halon 242; Genetron 114

MSDS # : 001019

Date of Preparation/ Revision : **3/24/2014.**

In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas. [Liquefied gas]

WARNING!

MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

May cause target organ damage, based on animal data.

Contact with rapidly expanding gases can cause frostbite.

Target organs : May cause damage to the following organs: lungs, cardiovascular system, upper respiratory tract.

Routes of entry : Inhalation

Potential acute health effects

Eyes : Liquid can cause burns similar to frostbite.

Skin : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Inhalation : Acts as a simple asphyxiant.

Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects

Chronic effects : May cause target organ damage, based on animal data.

Target organs : May cause damage to the following organs: lungs, cardiovascular system, upper respiratory tract.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

Name	CAS number	% Volume	Exposure limits
1,2-Dichlorotetrafluoroethane (Halocarbon 114)	76-14-2	100	**ACGIH TLV (United States, 3/2012).** TWA: 6990 mg/m³ 8 hours. TWA: 1000 ppm 8 hours. **NIOSH REL (United States, 1/2013).** TWA: 7000 mg/m³ 10 hours. TWA: 1000 ppm 10 hours. **OSHA PEL (United States, 6/2010).** TWA: 7000 mg/m³ 8 hours. TWA: 1000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 7000 mg/m³ 8 hours. TWA: 1000 ppm 8 hours.

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training.If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact with liquid, warm frozen tissues slowly with lukewarm water. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : As this product rapidly becomes a gas when released, refer to the inhalation section.

Section 5. Fire-fighting measures

Flammability of the product : Non-flammable.

Products of combustion : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
carbonyl halides

Fire-fighting media and instructions : Use an extinguishing agent suitable for the surrounding fire.

Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.

Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Handling : High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty.

Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure controls/personal protection

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Personal protection in case of a large spill : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Product name

cryofluorane

ACGIH TLV (United States, 3/2012).
TWA: 6990 mg/m³ 8 hours.
TWA: 1000 ppm 8 hours.
NIOSH REL (United States, 1/2013).
TWA: 7000 mg/m³ 10 hours.
TWA: 1000 ppm 10 hours.
OSHA PEL (United States, 6/2010).
TWA: 7000 mg/m³ 8 hours.
TWA: 1000 ppm 8 hours.
OSHA PEL 1989 (United States, 3/1989).
TWA: 7000 mg/m³ 8 hours.
TWA: 1000 ppm 8 hours.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight : 170.92 g/mole

Molecular formula : C2-Cl2-F4

Boiling/condensation point : 3.8°C (38.8°F)

Melting/freezing point : -94°C (-137.2°F)

Critical temperature : 145.7°C (294.3°F)

Vapor density : 5.9 (air = 1.0)

Specific Volume (ft ^{3}/lb) : 2.1277

Gas Density (lb/ft ^{3}) : 0.47

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Product/ingredient name	Result	Species	Dose	Exposure
cryofluorane	LD Oral LC50 Inhalation Gas.	Rat Rat	>2250 mg/kg 72 pph	- 30 minutes

IDLH : 15000 ppm

Chronic effects on humans : **CARCINOGENIC EFFECTS**: A4 (Not classifiable for humans or animals.) by ACGIH. May cause damage to the following organs: lungs, cardiovascular system, upper respiratory tract.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.

Products of degradation : Products of degradation: carbon oxides (CO, CO_2), halogenated compounds.

Environmental fate : Not available.

Environmental hazards : This product shows a low bioaccumulation potential.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE OR REFRIGERANT GAS R 114	2.2	Not applicable (gas).		**Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: 75 kg **Cargo aircraft** Quantity limitation: 150 kg **Special provisions** T50
TDG Classification	UN1958	DICHLORO-1,1,2, 2-TETRAFLUOROETHANE; OR REFRIGERANT GAS R 114	2.2	Not applicable (gas).		**Explosive Limit and Limited Quantity Index** 0.125 **Passenger Carrying Road or Rail Index** 75
Mexico Classification	UN1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE OR REFRIGERANT GAS R 114	2.2	Not applicable (gas).		-

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 15. Regulatory information

United States

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined
United States inventory (TSCA 8b): This material is listed or exempted.
TSCA 12(b) annual export notification: cryofluorane

SARA 302/304: No products were found.
SARA 311/312 Hazards identification: Sudden release of pressure, Delayed (chronic) health hazard

SARA 313

Product name	CAS number	Concentration

Form R - Reporting requirements	:	Halocarbon R-114 (1,2-Dichlorotetrafluoroethane)	76-14-2	100
Supplier notification	:	Halocarbon R-114 (1,2-Dichlorotetrafluoroethane)	76-14-2	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations :

Connecticut Carcinogen Reporting: This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
New York Acutely Hazardous Substances: This material is listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is not listed.
Rhode Island Hazardous Substances: This material is not listed.

Canada

WHMIS (Canada) : Class A: Compressed gas.

CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

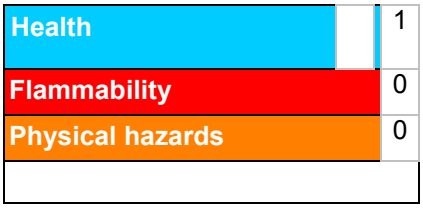
United States

Label requirements : MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

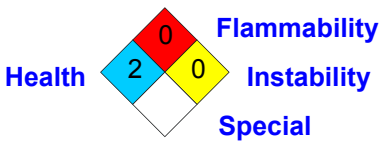
Canada

Label requirements : Class A: Compressed gas.

Hazardous Material Information System (U.S.A.) :



National Fire Protection Association (U.S.A.) :



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.